BANGALORE WATER SUPPLY
AND SEWRAGE BOARD
CAUVERY BHAVAN, KEMPEGOWDA ROAD
BANGALORE - 560 009

Telephone: 91-80-22945106 Fax: 91-80-22945106

Through E-Procurement

TENDER FOR THE WORK OF

DESIGN, CONSTRUCTION, AND COMMISSIONING OF **75 MLD STP BASED ON SBR WITH BNR, TERTIARY TREATMENT, POWER GENERATION & ODOUR CONTROL UNITS AT MADIWALA** INCLUDING 7 YEARS OPERATION AND MAINTENANCE. (TURNKEY CONTRACT)

VOLUME 3 of 4

(DRAWINGS)

OCTOBER – 2025

Office of the *Chief Engineer (WWM-E)/CE (UWP)*
BANGALORE WATER SUPPLY & SEWERAGE BOARD
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8	Single Line Diagram for the Electrical Works (75 MLD capacity STP at Madiwala)	TCE.13052A-EL-4000-AU-40005	P0

TITLE: PROCESS FLOW DIAGRAM

DWG NO: TCE.13052A-CV-3008-SL-30001A

RAW SEWAGE

OCU-1

INLET CHAMBER

TRASH SCREEN

TROLLY

SCREENED MATERIAL FOR DISPOSAL

COARSE SCREEN

TROLLY

SCREENED MATERIAL FOR DISPOSAL

WET WELL

OVERFLOW BYPASS

BYPASS

OCU-2

SCREENED MATERIAL FOR DISPOSAL

TROLLY

GRIT DISPOSAL

TROLLY

GRIT WASHING

BYPASS

BYPASS

TO SCUM PIT

INLET CHAMBER

FINE SCREENS CHANNEL

VORTEX GRIT CHAMBER

PARSHALL FLUME

PLATE SETTLER

PROCESS AIR

SBR TANK

ALUM DOSING

SBR

DISC FILTER BYPASS

DISC FILTER

CHLORINE

CHLORINE CONTACT TANK

BACK WASH

BACK WASH RETURN

OUTFALL STRUCTURE

EXISTING JACKWELL

FINAL DISPOSAL

TREATED WATER STORAGE

TO DISC FILTER BACKWASH

TO PLANT UTILITIES

FOR TANKER FILLING

THICKENER DILUTION WATER

RO PLANT

SEPTIC TANK

WASTE WATER FROM ADMIN BUILDING

OCU-3

DILUTION WATER

WAS

FROM PLATE SETTLER

SCUM PIT

DRAIN FROM ALL PROCESS BUILDINGS

PLAN DRAIN SUMP

THICKENER DISTRIBUTION CHAMBER

COOLING WATER OUT

TO INTERNAL ELECTRICAL DISTRIBUTION

COOLING SYSTEM

CHEMICAL

OVERFLOW TO PLANT DRAIN SUMP

SLUDGE THICKENER

CENTRIFUGE FEED SUMP

POLYMER DOSING

CENTRIFUGE

EXHAUST GAS

HOT WATER

BIOGAS ENGINE

BIOGAS DRYING SYSTEM

BIOGAS SCRUBBER

CHIMNEY WITH HEAT RECOVERY

COOLING WATER IN

DROPLET SEPARATOR

CAKE HOPPER AND CONVEYOR

TROLLY

SLUDGE FOR DISPOSAL

GAS MIX

GAS HOLDER

SLUDGE DIGESTOR

HOT WATER IN

GAS

HEAT EXCHANGER

BOILER

HEAVY OIL

WATER SEALING

VOLUME MIXING

HOT WATER OUT

BIOGAS FLARE

DRAIN

HOT WATER STORAGE TANK

RO STORAGE TANK

FOR COOLING AND HOT WATER SYSTEM

FROM PUBLIC WATER SUPPLY

BREAK TANK

POTABLE USE

OVER HEAD TANK

FOR TENDER PURPOSE ONLY

	SIGN.												
	INITIALS												
	REVISIONS												
	SIGN.												
	INITIALS												
	REVISIONS												
PO	SIGN.												
	INITIALS												
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME		PE/PM	APPD	DATE	
					CLEARED								

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: PROCESS FLOW DIAGRAM

TATA CONSULTING ENGINEERS LIMITED

SCALE : NTS | DWG NO. TCE.13052A-CV-3008-SL-30001A | ISSUE P0

DC & DISC: BLR-CV

SIZE-A1

TCE FORM NO. 091 R1

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FILE NAME : PFD (75 MLD Madiwala).dwg

FILE NAME: F-091-Rev-R1.dwg

TITLE: OVERALL PLANT LAYOUT WITH CONTOURS

DWG NO TCE.13052A-CV-3008-SL-30100

MADIWALA TSPS COMPONENT LIST

SI NO.	COMPONENT NAME	NO. OF UNITS	SIZE IN METERS				
	TERMINAL SEWAGE PUMPING STATION (TSPS)		L	W	LD*/H	DIA	Free board (m)
01	TSPS INLET CHAMBER	1	2.70	8.60	1.30	–	0.75m Above FGL
02	TRASH SCREEN & COARSE SCREEN CHANNEL	4	10.00	1.70	1.00	–	0.75m Above FGL
03	COARSE SCREEN EFFLUENT CHANNEL	1	1.50	8.60	0.90	–	0.75m Above FGL
04	WET WELL	1	–	–	2.50	17.30	0.75m Above FGL
05	PUMPING HOUSE (ABOVE WET WELL)	1	–	–	5.50	17.30	–
06	VALVE CHAMBER	2	13.00	3.00	3.00	–	–

MADIWALA 75MLD STP COMPONENT LIST

SI NO.	COMPONENT NAME	NO. OF UNITS	SIZE IN METERS				
	SEWAGE TREATMENT PLANT (STP)		L	W	LD*/H	DIA	Free board (m)
07	STP INLET CHAMBER	1	1.80	12.40	1.80	–	0.50
08	FINE SCREEN CHANNEL	4	7.00	2.20	1.10	–	0.50
09	FINE SCREEN EFFLUENT CHANNEL	1	1.50	12.40	1.00	–	0.50
10	GRIT CHAMBER	4	–	–	1.50	4.20	0.50
11	PARSHALL FLUME CHANNEL	1	25.00	2.40	1.00		0.50
12	PRIMARY CLARIFIER FLOW DISTRIBUTION BOX	1	6.00	3.80	1.80	–	0.50
13	PRIMARY CLARIFIER WITH PLATE SETTLERS	4	16.50	16.50	4.30	–	0.50
14	PRIMARY SLUDGE PUMP HOUSE	1	15.00	10.00	5.50	–	–
15	SBR FLOW DISTRIBUTION BOX	1	5.60	4.00	1.80	–	0.50
16	SBR TANKS	6	44.00	33.20	6.00	–	0.60
17	NOT USED	–	–	–	–	–	–
18	DISK FILTER FLOW DISTRIBUTION BOX	1	6.00	3.60	1.40	–	0.50
19	DISC FILTER INFLUENT AND EFFLUENT CHANNEL	1	14.60	2.00	0.90	–	0.50
20	DISC FILTERS	3	8.00	3.00	1.50	–	0.50
21	DISC FILTER BYPASS CHANNEL	1	8.00	2.00	0.90	–	0.50
22	DISC FILTER BUILDING(ABOVE DISC FILTER)	1	8.00	14.60	5.50	–	RCC Framed stilt structure
23	CCT FLOW DISTRIBUTION BOX	1	6.00	3.60	1.40	–	0.50
24	CHLORINE CONTACT TANK	4	28.00	6.80	2.10	–	0.50
25	CCT EFFLUENT CHANNEL	1	28.00	2.00	0.90	–	0.50
26	BLOWER BUILDING(INCLUDING ELECTRICAL PANEL)	1	29.00	13.00	9.00	–	–
27	CHEMICAL BUILDING	1	12.00	11.00	5.50	–	–
28	CHLORINATION BUILDING	1	24.00	15.00	5.50	–	–
29	SLUDGE BALANCING/FLOW DISTRIBUTION BOX TO THICKENER	1	5.50	5.50	2.20	–	0.50
30	GRAVITY SLUDGE THICKENER	2	–	–	4.20	21.50	0.50
31	SLUDGE THICKENED BUILDING	1	15.00	9.00	5.50	–	–
32	ANAEROBIC SLUDGE DIGESTER	2	–	–	10.00	30.50	
33	SLUDGE DIGESTER BUILDING	1	20.00	12.00	6.00	–	G+2
34	BIOGAS HOLDER	2	–	–	8.00	16.00	–
35	BIOGAS SCRUBBING AREA	1	12.00	9.00	–	–	–
36	BIOGAS SCRUBBING BLOWER BUILDING	1	9.00	8.00	7.50	–	–
37	BIOGAS BURNER AREA	1	12.00	6.00	–	–	–
38	CENTRIFUGE FEED SUMP	1	8.00	11.50	3.50	–	Top of sump shall be same as the level of digestor
39	CENTRIFUGE FEED PUMP HOUSE	1	8.00	9.00	5.50	–	–
40	CENTRIFUGE BUILDING(G+1)	1	8.00	9.00	5.50	–	–
41	SCUM PIT	1	–	–	2.00	9.00	2.00
42	PLANT DRAIN SUMP	1	–	–	2.00	10.00	2.50
43	TREATED WATER STORAGE	1	9.00	5.00	3.50	–	1.00
44	RO BUILDING	1	10.00	7.00	5.50	–	
45	TRANSFORMER YARD	1	18.00	7.00	–	–	–
46	ELECTRICAL SUB STATION(TSPS/STP)	1	35.00	18.00	5.50	–	–
47	PLANT DG ROOM	1	18.00	12.00	6.50	–	–
48	STORE/TOOL/MAINTENANCE WORKSHOP	1	15.00	10.00	6.00	–	–
49	ADMIN BUILDING INLUDES PLC SCADA,LABORATORY(G+1)	1	15.00	12.00	4.50	–	–
50	PARKING SHED	1	15.00	6.00	4.50	–	–
51	GUARD ROOM(SECURITY ROOM)	1	3.00	3.00	3.00	–	–
52	OUTFALL CHAMBER	1	5.00	3.00	1.50	–	1m aboveFGL
53	OVERFLOW CHAMBER	3	2.00	2.00	1.50	–	0.50
54	ODOUR CONTROL ROOM(OCU 1) NEAR TSPS	1	8.00	5.00	6.00	–	RCC stilt room
55	OCU 2 (Near Preliminary treatment units)	1	8.00	5.00	6.00	–	RCC stilt room
56	OCU 3 (Near Sludge handling units)	1	8.00	5.00	6.00	–	RCC stilt room
57	BIOGAS ENGINE ROOM	1	15.00	12.00	6.50	–	–

LIST OF POINTS

POINTS	EASTING	NORTHING	RL
SBM9	783245.968	1428062.720	885.716
SBM10	783308.599	1428056.949	885.788
M1	783241.918	1428063.852	885.770
M1A	783217.250	1428059.555	885.772
M2	783285.565	1428059.864	885.628
M3	783329.729	1428051.657	885.174
M4	783341.819	1428028.172	885.143
S5	783246.253	1428091.136	886.176
S5A	783171.955	1428102.629	886.514
V1	783237.644	1428032.188	885.810
V2	783314.618	1428029.872	885.034
V3	783120.555	1427962.231	886.683
V4	783292.837	1427925.262	884.901
V5	783122.893	1427840.696	886.585

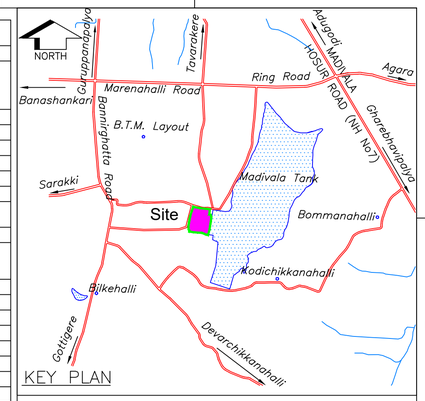
LIST OF BOUNDARY DETAILS

BOUNDARY POINTS	CO-ORDINATES		DISTANCE IN METERS
	EASTING	NORTHING	
B2	783348.215	1428076.546	174.814
B3	783340.848	1428023.577	53.479
B4	783354.892	1428021.379	14.215
B5	783362.294	1427997.319	25.221
B6	783327.855	1427811.387	189.524
B7	783261.792	1427834.813	70.402
B8	783136.527	1427847.383	126.239
B9	783137.349	1427855.051	7.715
B10	783135.260	1427855.474	2.131
B1	783175.917	1428103.831	255.809

AREA STATEMENT

Area in Sqmt	Area in Acre
52857.641	13.061

HFL : 886.410



LEGENDS:

- RAW SEWAGE PIPE
- BYPASS LINE
- SLUDGE PIPE
- SCUM PIPE
- SUPERNATANT PIPE
- PROPOSED ROAD
- TREATED WATER
- EXISTING ROAD
- (10) PROPOSED STP UNITS
- PROPOSED PRECAST RCC PRECAST COMPOUND WALL
- PROPOSED PRECAST RCC RETAINING WALL
- ASPHALT ROAD, DRAIN.
- CONCRETE ROAD, CART TRACK.
- BUILDING/SHEDS, FOOTPATH.
- COMPOUND WALL , FENCE, LAMP POST.
- ORDINARY TREE, BAMBOO TREE, PIPE.
- BOUNDARY & POINTS, TRANSFORMER. B1 B2
- CONTOUR WITH CONT RL, SPOT LEVELS. 885.4 885.966
- INVERT LEVEL, CHAMBER INVERT LEVELS. 883.659 884.949
- BENCH MARKS, TRAVERSE POINTS. SBM9 M1

NOTES:

1. ALL LEVELS ARE IN METERS,UNLESS OTHER WISE MENTIONED.
2. ALL LEVELS ARE WITH REFERENCE TO THE GTS BENCH MARK ENGRAVED ON CENTER OF 2ND STONES ON EAST SIDE OF QUEEN VICTORIA'S STATUE IN CUBBON PARK,BANGALORE.ITS VALUE IS 912.266M.
3. ALL THE CO-ORDINATES ARE BASED ON UTM WGS-84.
4. ALL THE PROCESS AND NON-PROCESS BUILDING DIMENSIONS SHOWN ARE MINIMUM AND HEIGHT OF THE BUILDING SHALL BE FROM FINISHED FLOOR LEVEL TO THE BOTTOM OF THE ROOF BEAM.
5. FINISHED FLOOR LEVEL OF ALL PROCESS AND NON PROCESS BUILDING SHALL BE ATLEAST 500MM ABOVE THE FINISHED GROUND LEVEL.
6. FINISHED GROUND LEVEL (FGL) OF THE STP SHALL BE MINIMUM 500MM ABOVE THE HFL.
7. ALL THE BUILDING DIMENSIONS (OR AREA WHEN CALCULATED) SHOWN ARE MINIMUM. HOWEVER, CONTRACTOR MAY UPSIZE THESE DIMENSIONS (OR AREA WHEN CALCULATED) BASED ON HIS DESIGN TO MEET THE SPECIFIED TENDER REQUIREMENTS.
8. CONTRACTOR HAS TO PROPOSE A PILE FOUNDATION FOR ALL PROCESS UNITS INCLUDING FOR ALL TYPES OF BUILDINGS AS A PART OF THE FOUNDATION DESIGN OF THIS STP.
9. TOTAL LENGTH OF PROPOSED 5m WIDE ROAD = 1430m
10. TOTAL LENGTH OF PROPOSED RCC PRECAST COMPOUND WALL = 420m
10 TOTAL LENGTH OF PROPOSED RCC RETAINING WALL = 495m

FOR TENDER PURPOSE ONLY

	SIGN.												
	INITIALS												
	REVISIONS												
	SIGN.												
	INITIALS												
	REVISIONS												
PO	SIGN.												
	INITIALS												
ISSUE		DRN	DSN	CHD	CV	EL	IC	ME	CLEARED		PE/PM	APPD	DATE

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: OVERALL PLANT LAYOUT WITH CONTOURS

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FILE NAME : LAYOUT (75 MLD Madiwala).dwg

TATA CONSULTING ENGINEERS LIMITED

SCALE : NTS | DWG NO. TCE.13052A-CV-3008-SL-30100 | ISSUE P0 | SIZE-A1

DC & DISC : BLR-CV

FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 75MLD STP, MADIWALA LAKE

DWG NO TCE.13052A-EL-4001-AU-40000

LEGENDS:-

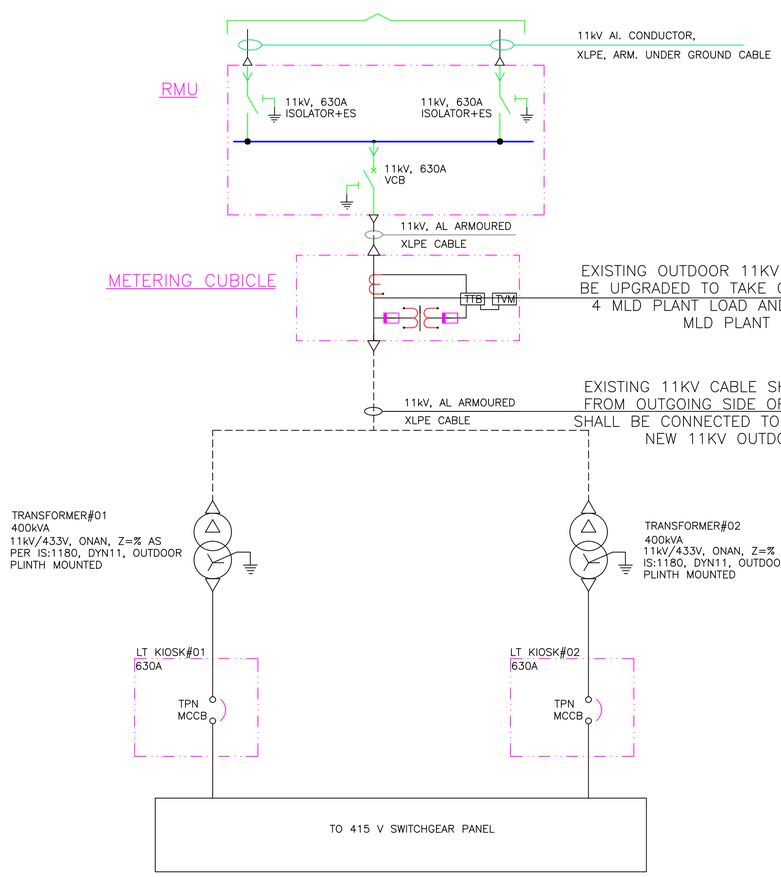
RELAYING

50	INSTANTANEOUS PHASE OVER CURRENT RELAY SUFFIX N- GROUND
51	INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAY SUFFIX N- GROUND, SUFFIX NS-STANDBY EARTH
95	TRIP CIRCUIT SUPERVISION RELAY
94	ANTI-PUMPING RELAY
27	UNDER VOLTAGE RELAY
86	LOCKOUT RELAY (HAND RESET)
OSR	OIL SURGE RELAY
PRV	PRESSURE RELEASE VALVE
50BF	BREAKER FAIL
46	REVERSE PHASE/UNBALANCE
24	VOLTS PER HERTZ RELAY
49	TRANSFORMER THERMAL RELAY
64R	RESTRICTED EARTH FAULT PROTECTION RELAY

- 3-PH DISTRIBUTION TRANSFORMER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CABLE TERMINATION
- 415V DRAW OUT TYPE AIR CIRCUIT BREAKER
- 11KV DRAW OUT TYPE VACUUM CIRCUIT BREAKER
- 415V MOULDED CASE CIRCUIT BREAKER
- 415V MINIATURE CIRCUIT BREAKER
- BREAKER CONTROL SWITCH
- INDICATING LAMP
- MOTOR
- STAR-DELTA STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- DIRECT ONLINE STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- DG SET WITH AMF CONTROL PANEL
- TCH: TRIP CIRCUIT HEALTHY INDICATION (WHITE LED)
- SC: SPRING CHARGED INDICATION (BLUE LED)
- BON: BREAKER ON INDICATION (RED LED)
- BOFF: BREAKER OFF INDICATION (GREEN LED)
- TRIP: TRIPPED ON FAULT INDICATION (AMBER LED)
- DCF: DC SUPPLY FAIL INDICATION (AMBER LED)
- BS: BREAKER IN SERVICE POSITION (RED LED)
- BT: BREAKER IN TEST POSITION (CLEAR LED)
- ACF: AC SUPPLY FAIL INDICATION (AMBER LED)
- OFF: OFF INDICATION (GREEN LED)
- TRIP: TRIP INDICATION (AMBER LED)
- R: R-PHASE INDICATION LAMP (RED LED)
- Y: Y-PHASE INDICATION LAMP (YELLOW LED)
- B: B-PHASE INDICATION LAMP (BLUE LED)
- LOCAL/OFF/REMOTE SELECTOR SWITCH
- SA: SURGE ARRESTER
- ASS+DA: DIGITAL AMMETER WITH BUILT IN SELECTOR SWITCH
- VSS+DV: DIGITAL VOLTMETER WITH BUILT IN SELECTOR SWITCH
- 415V, FIXED TYPE MOTOR PROTECTION CIRCUIT BREAKER (MPCB)
- ICP: INSTRUMENTATION CONTROL PANEL
- N.RELAY: NUMERICAL RELAY
- MFM: MULTI FUNCTION METER WITH RS485 COMMUNICATION (AMMETER, VOLTMETER, PF, FREQUENCY)
- PLC: PROGRAMMABEL LOGIC CONTROLLER
- MPR: COMPREHENSIVE MOTOR PROTECTION RELAY
- M: METERING UNIT
- CAPACITOR BANK
- LCSP: LOCAL CONTROL STARTER PANEL
- TTB(CT SHORT LINK)
- SS: SOFT STARTER
- SI: LOCAL ISOLATOR SWITCH
- RC: READY TO CLOSE (CLEAR LED)
- LCP: LOCAL CONTROL PANEL
- TR: CONTROL TRANSFORMER
- I/L: INTER LOCK

NOTES:

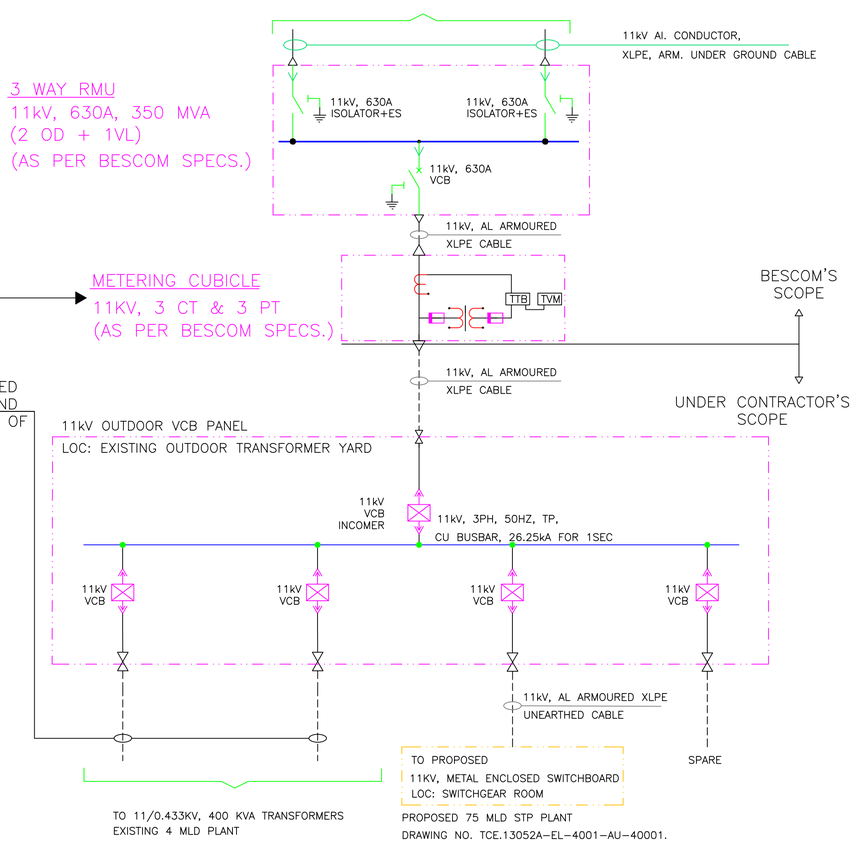
1. TRIP COIL CIRCUITS OF ALL CIRCUIT BREAKERS SHALL BE PROVIDED WITH TRIP SUPERVISION RELAY TO SUPERVISE THE CIRCUIT IN BOTH OPEN AND CLOSED POSITION OF CIRCUIT BREAKERS.
2. ALL RELAYS USED IN 11kV SWITCHGEAR SHALL BE NUMERICAL TYPE.
3. AMMETERS IN MOTOR FEEDERS SHALL BE PROVIDED WITH SUPPRESSED SCALE UP TO 6 TIMES FULL LOAD CURRENT FOR INDICATION STARTING CURRENT.
4. ACB's SHALL BE PROVIDED WITH MICROPROCESSOR RELEASES FOR ADJUSTABLE OVERLOAD SHORT CIRCUIT, UNDER VOLTAGE AND EARTH FAULT FOR LT BREAKER. VCB'S SHALL BE PROVIDED WITH SHUNT TRIP COILS RATED WITH 110V DC FOR HT BREAKER.
5. MCCB's SHALL BE PROVIDED WITH ELECTRONIC RELEASES FOR ADJUSTABLE OVERLOAD, SHORT CIRCUIT AND EARTH FAULT.
6. ALL PANEL WIRING SHALL BE WITH 1100 VOLTS GRADE PVC INSULATED 1.5 Sqmm STRANDED COPPER WIRE FOR CONTROL WIRING & 2.5 Sqmm FOR CT SECONDARY WIRING.
7. ALL CT'S SHALL BE OF 5A SECONDARY.
8. ALL CONTACTOR/TIMERS etc., SHALL BE RAIL MOUNTED.
9. MINIMUM CONTACTOR RATING SHALL BE 16A.
10. CONTROL SUPPLY SHALL BE 240V AC TAPPED BETWEEN PHASE AND NEUTRAL FEEDERS MODULES.
11. MPCB SHALL BE WITH IN BUILT SINGLE PHASING PREVENTER.
12. ALL CONTACTORS SHALL BE OF AC 3 DUTY.
13. WIDTH OF FEEDER COLOUMN SHALL BE MINI 500 mm CABLE ALLEY SHALL BE 300mm MINI.
14. ALL ACB, MCCB, CONTACTORS, MPCB, & MPR SHALL BE OF TYPE-2 CO-ORDINATION.
15. LCP SHALL BE AS INDICATED IN P&ID.
16. CT RATIO SHALL BE 20% MORE THAN THE FLC 0.85PF & 0.9 EFFICIENCY.
17. CABLE COMPARTMENT SHALL HAVE LED LAMP INTERLOCKED WITH DOOR.
18. ALL INDICATION LAMP SHALL HAVE LED CLUSTER TYPE.
19. ALL MCCB SHALL HAVE EXTENDED ROTORY HANDLE & EXTENDED BUSBAR LINK
20. OPERATION LOGIC OF 415V SWITCHBOARD:
(A) AT NORMAL CONDITION BOTH THE TRANSFORMER INCOMER FEEDER SHALL BE IN CLOSED POSITION. THE BUS COUPLER AND DG INCOMER IN OPEN POSITION.
(B) IN CASE OF FAULTS, THE FAULTY INCOMER FEEDER SHALL BE OPEN POSITON THE BUS COUPLER AND THE HEALTHY INCOMER FEEDER SHALL BE CLOSED POSITON.
(C) IN CASE OF POWER FAILURE, THE DG INCOMER, BUS COUPLER SHALL BE IN CLOSED POSITION. BOTH THE TRANSFORMER INCOMER SHALL BE SWITCHED OFF BY ACTIVATION OF UNDER VOLTAGE RELAY OF THE GRID INCOMER.
21. MOTOR FEEDER <5.5kW WILL HAVE DIRECT CONNECTED AMMETER IN Y PHASE, MOTORS >5.5kW UPTO 15kW WILL BE PROVIDED WITH 1 CT AND AMMETER AND MOTOR >15kW AND ABOVE WILL BE PROVIDED WITH 3 CTS AND AMMETER.
22. NECESSARY INTERLOCK TO SPACE HEATER WITH MOTORS TO BE PROVIDED.
23. ALL MCB SHALL HAVE KW = 100% Ics.
24. ALL MCCB CONNECTED TO MOTOR SHALL BE RATED TO MOTOR DUTY.
25. ALL ACB SHALL HAVE Icu = Ics = Icw.
26. THE 415V SIDE OF THE TRANSFORMER IS PROVIDED WITH NON SEGREGATED ALUMINUM BUS DUCT IF THE TRANSFORMER RATING IS GREATER THAN OR EQUAL TO 1000KVA. FOR THE TRANSFORMER RATING IS LESS THAN 1000KVA XLPE AL ARMOUED CABLE SHALL BE PROVIDED ON 415V SIDE.
27. CABLE SIZES LESS THAN OR EQUAL TO 6 Sqmm SHALL BE PROVIDED WITH COPPER CONDUCTORS AND AL CONDUCTORS TO BE USED FOR CABLE SIZES ABOVE 6 Sqmm.
28. CAPACITOR BANK WITH APFC SHALL BE PROVIDED WITH INTERLOCK SUCH THAT PANELS ARE FED BY DG SET, CAPACITOR BANK SHALL BE DISCONNECTED.
29. 20% SPARE FEEDERS WITH MINI OF 1 SPARE FEEDER FOR EACH RATING OF THE OUTGOING FEEDERS SHALL BE PROVIDED IN LT PANELS (PCC/MCC).
30. PORTABLE TYPE STARTER WILL BE PROVIDED FOR GATES.



EXISTING OUTDOOR 11KV METERING SHALL BE UPGRADED TO TAKE CARE OF EXISTING 4 MLD PLANT LOAD AND PROPOSED 75 MLD PLANT LOAD

EXISTING 11KV CABLE SHALL BE DISCONNECTED FROM OUTGOING SIDE OF METERING PANEL AND SHALL BE CONNECTED TO THE OUTGOING SIDE OF NEW 11KV OUTDOOR VCB PANEL

EXISTING BESCOM INCOMING & METERING ARRANGEMENT AT EXISTING 4 MLD STP PREMISES AT MADIWALA



BESCOM INCOMING & METERING ARRANGEMENT FOR PROPOSED 75 MLD STP & EXISTING 4 MLD STP

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					CLEARED								

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 01 OF 06

TATA CONSULTING ENGINEERS LIMITED
MUMBAI

SCALE : NTS | DC & DISC: BLR-EL | DWG NO. TCE.13052A-EL-4001-AU-40000 | ISSUE P0 | SIZE-A1

TCE FORM NO. 091 R1

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FILE NAME : SLD (75 MLD Madiwala).dwg

FILE NAME: F-091-Rev-R1.dwg

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 75MLD STP, MADIWALA LAKE

DWG NO TCE.13052A-EL-4001-AU-40001

LEGENDS:-

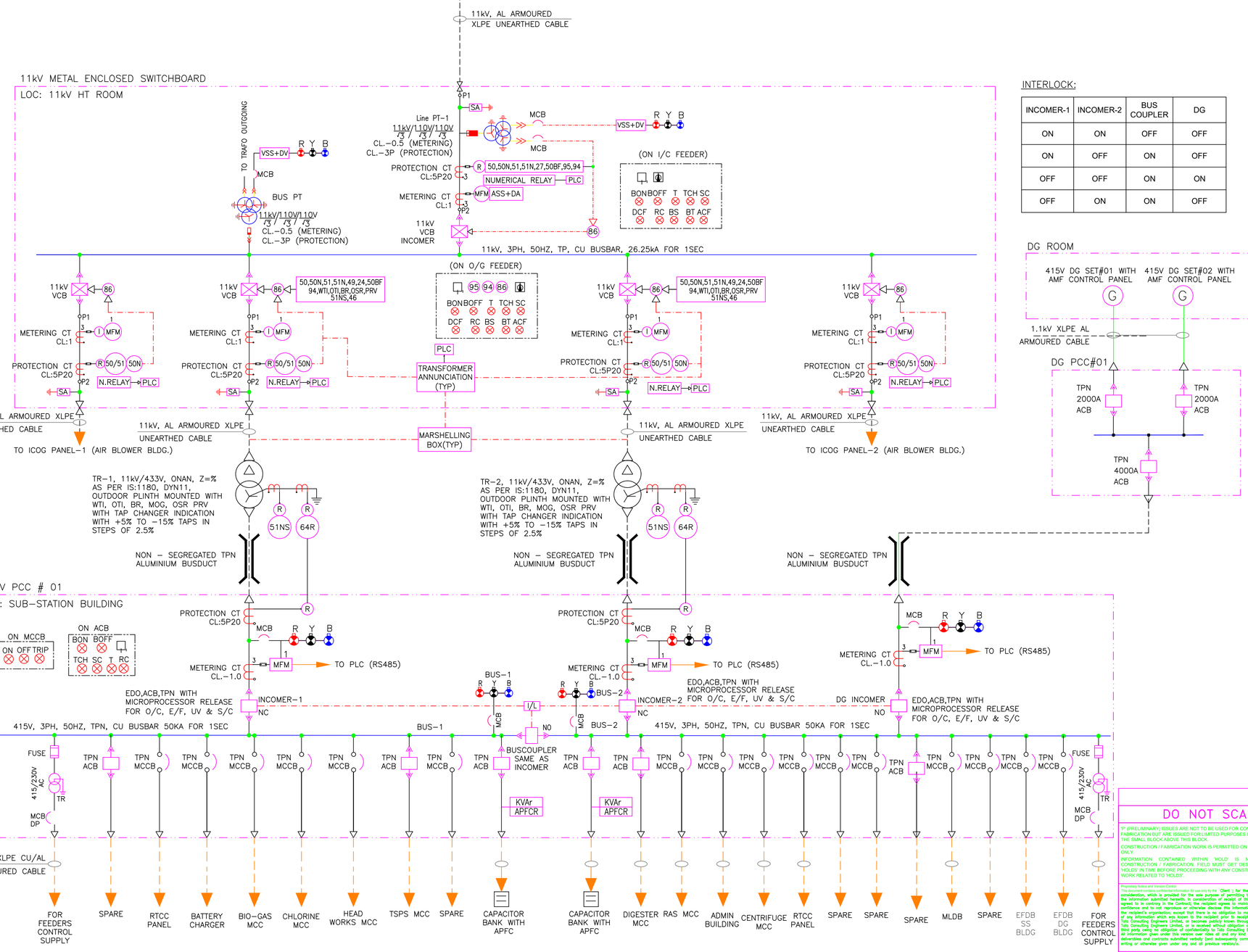
(K) RELAYING

50	INSTANTANEOUS PHASE OVER CURRENT RELAY SUFFIX. N- GROUND
51	INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAY SUFFIX N- GROUND, SUFFIX NS-STANDBY EARTH
95	TRIP CIRCUIT SUPERVISION RELAY
94	ANTI-PUMPING RELAY
27	UNDER VOLTAGE RELAY
86	LOCKOUT RELAY (HAND RESET)
OSR	OIL SURGE RELAY
PRV	PRESSURE RELEASE VALVE
50BF	BREAKER FAIL
46	REVERSE PHASE/UNBALANCE
24	VOLTS PER HERTZ RELAY
49	TRANSFORMER THERMAL RELAY
64R	RESTRICTED EARTH FAULT PROTECTION RELAY

- 3-PH DISTRIBUTION TRANSFORMER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CABLE TERMINATION
- 415V DRAW OUT TYPE AIR CIRCUIT BREAKER
- 11KV DRAW OUT TYPE VACUUM CIRCUIT BREAKER
- 415V MOULDED CASE CIRCUIT BREAKER
- 415V MINIATURE CIRCUIT BREAKER
- BREAKER CONTROL SWITCH
- INDICATING LAMP
- (M) MOTOR
- STAR-DELTA STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- DIRECT ONLINE STARTERS WITH SINGLE PHASE PREVENTOR AND MPR
- (G) DG SET WITH AMF CONTROL PANEL
- TCH TRIP CIRCUIT HEALTHY INDICATION (WHITE LED)
- SC SPRING CHARGED INDICATION (BLUE LED)
- BON BREAKER ON INDICATION (RED LED)
- BOFF BREAKER OFF INDICATION (GREEN LED)
- TRIPPED ON FAULT INDICATION (AMBER LED)
- DCF DC SUPPLY FAIL INDICATION (AMBER LED)
- BS BREAKER IN SERVICE POSITION (RED LED)
- BT BREAKER IN TEST POSITION (CLEAR LED)
- ACF AC SUPPLY FAIL INDICATION (AMBER LED)
- ON ON INDICATION (RED LED)
- OFF OFF INDICATION (GREEN LED)
- TRIP TRIP INDICATION (AMBER LED)
- R R-PHASE INDICATION LAMP (RED LED)
- Y Y-PHASE INDICATION LAMP (YELLOW LED)
- B B-PHASE INDICATION LAMP (BLUE LED)
- LOCAL/OFF/REMOTE SELECTOR SWITCH
- SA SURGE ARRESTER
- ASS+DA DIGITAL AMMETER WITH BUILT IN SELECTOR SWITCH
- VSS+DV DIGITAL VOLTMETER WITH BUILT IN SELECTOR SWITCH
- 415V, FIXED TYPE MOTOR PROTECTION CIRCUIT BREAKER (MPCB)
- ICP INSTRUMENTATION CONTROL PANEL
- N.RELAY NUMERICAL RELAY
- MFM MULTI FUNCTION METER WITH RS485 COMMUNICATION (AMMETER, VOLTMETER, PF, FREQUENCY)
- PLC PROGRAMMABEL LOGIC CONTROLLER
- MPR COMPREHENSIVE MOTOR PROTECTION RELAY
- M METERING UNIT
- CAPACITOR BANK
- LCSP LOCAL CONTROL STARTER PANEL
- TTB(CT SHORT LINK)
- SS SOFT STARTER
- ISO LOCAL ISOLATOR SWITCH
- RC READY TO CLOSE (CLEAR LED)
- LCP LOCAL CONTROL PANEL
- CONTROL TRANSFORMER
- TR
- I/L INTER LOCK

FROM 11KV OUTDOOR VCB PANEL

DWG REF. NO. DRAWING NO. TCE.13052A-EL-4001-AU-40000



INTERLOCK:

INCOMER-1	INCOMER-2	BUS COUPLER	DG
ON	ON	OFF	OFF
ON	OFF	ON	OFF
OFF	OFF	ON	ON
OFF	ON	ON	OFF

NOTES:

1. TRIP COIL CIRCUITS OF ALL CIRCUIT BREAKERS SHALL BE PROVIDED WITH TRIP SUPERVISION RELAY TO SUPERVISE THE CIRCUIT IN BOTH OPEN AND CLOSED POSITION OF CIRCUIT BREAKERS.
2. ALL RELAYS USED IN 11kV SWITCHGEAR SHALL BE NUMERICAL TYPE.
3. AMMETERS IN MOTOR FEEDERS SHALL BE PROVIDED WITH SUPPRESSED SCALE UP TO 6 TIMES FULL LOAD CURRENT FOR INDICATION STARTING CURRENT.
4. ACB's SHALL BE PROVIDED WITH MICROPROCESSOR RELEASES FOR ADJUSTABLE OVERLOAD SHORT CIRCUIT, UNDER VOLTAGE AND EARTH FAULT FOR LT BREAKER. VCB'S SHALL BE PROVIDED WITH SHUNT TRIP COILS RATED WITH 110V DC FOR HT BREAKER.
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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 02 OF 06

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FILE NAME : SLD (75 MLD Madiwala).dwg

TATA CONSULTING ENGINEERS LIMITED
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SCALE : NTS | DWG NO. TCE.13052A-EL-4001-AU-40001 | ISSUE P0 | SIZE-A1

DC & DISC: BLR-EL | TCE FORM NO. 091 R1

FILE NAME: F-091-Rev-R1.dwg

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 75MLD STP, MADIWALA LAKE

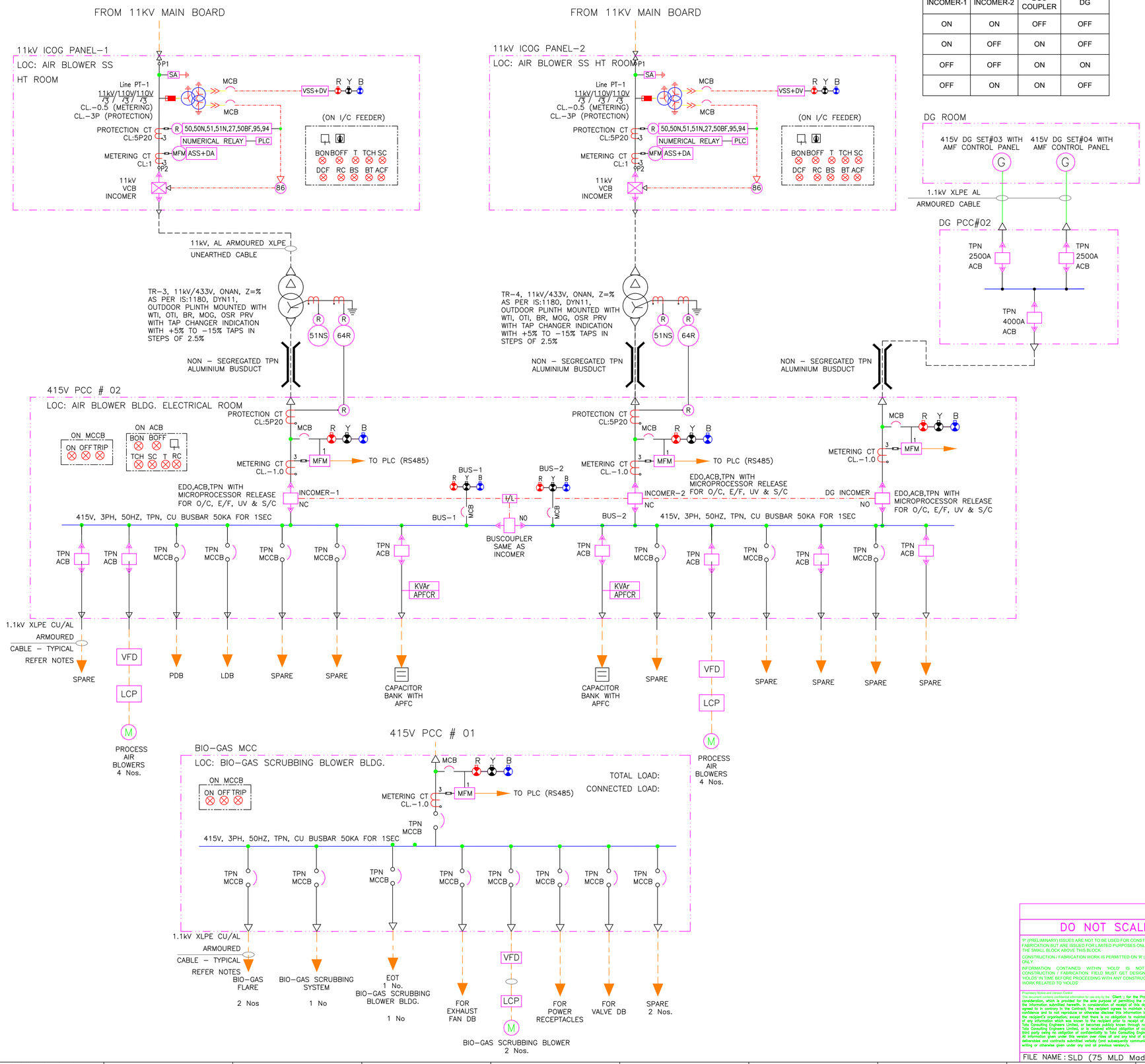
DWG NO TCE.13052A-EL-4001-AU-40002

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40001.

INTERLOCK:

INCOMER-1	INCOMER-2	BUS COUPLER	DG
ON	ON	OFF	OFF
ON	OFF	ON	OFF
OFF	OFF	ON	ON
OFF	ON	ON	OFF



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					CLEARED						

CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 03 OF 06

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SCALE : NTS	DWG NO.	ISSUE
DC & DISC: BLR-EL	TCE.13052A-EL-4001-AU-40002	P0

TCE FORM NO. 091 R1

SIZE-A1

FILE NAME: F-091-Rev-R1.dwg

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 75MLD STP, MADIWALA LAKE

DWG NO TCE.13052A-EL-4000-AU-40003

NOTES:-

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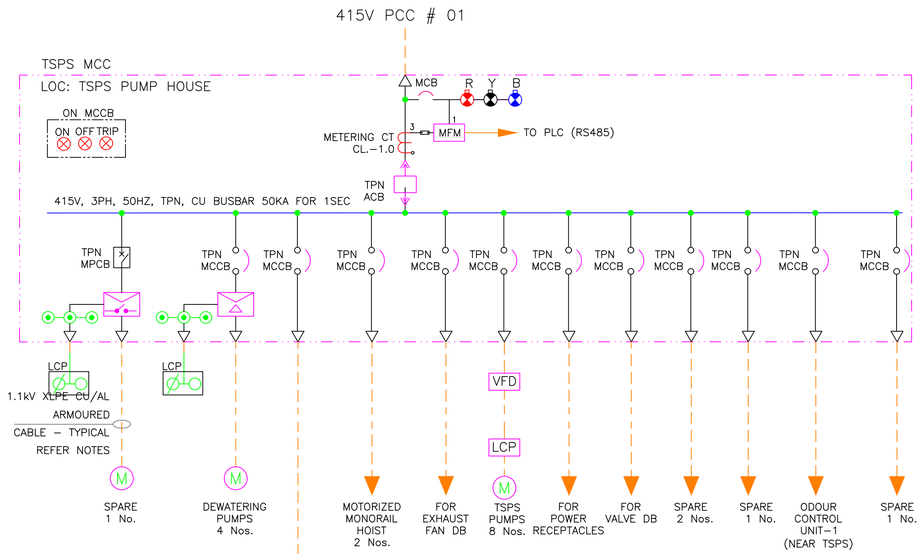

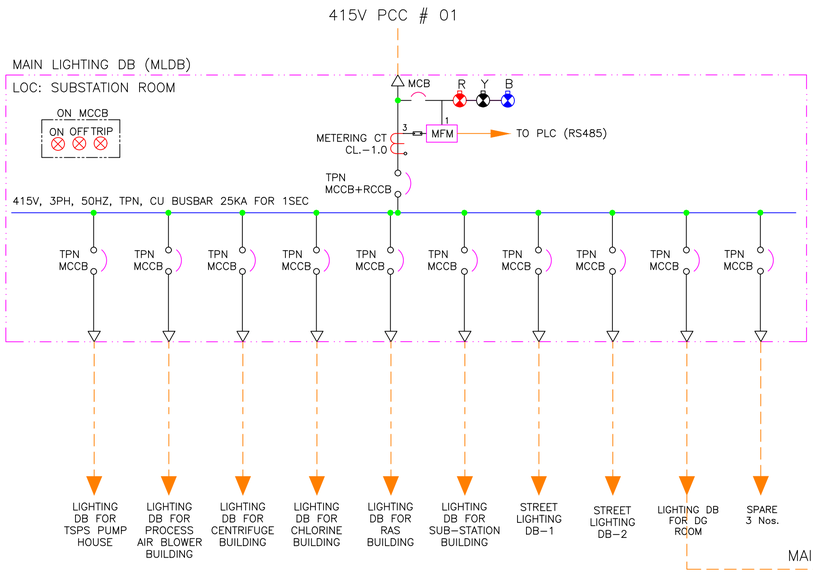

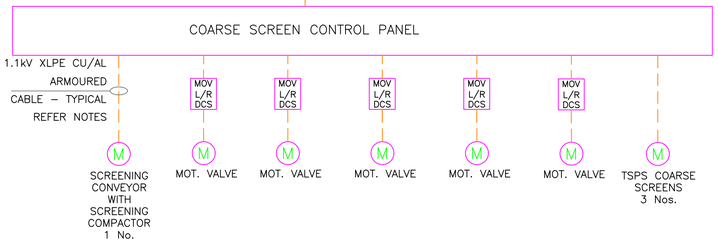

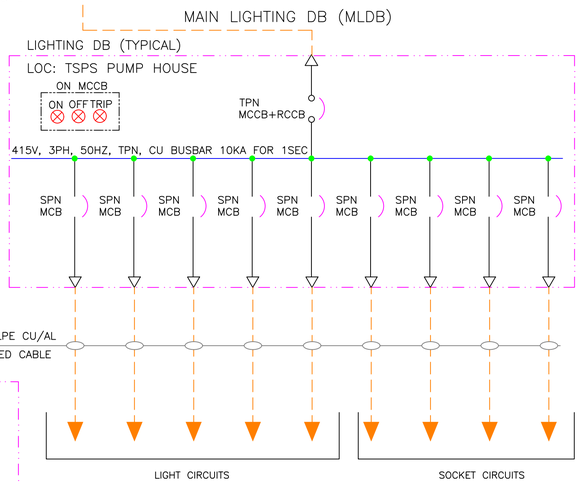

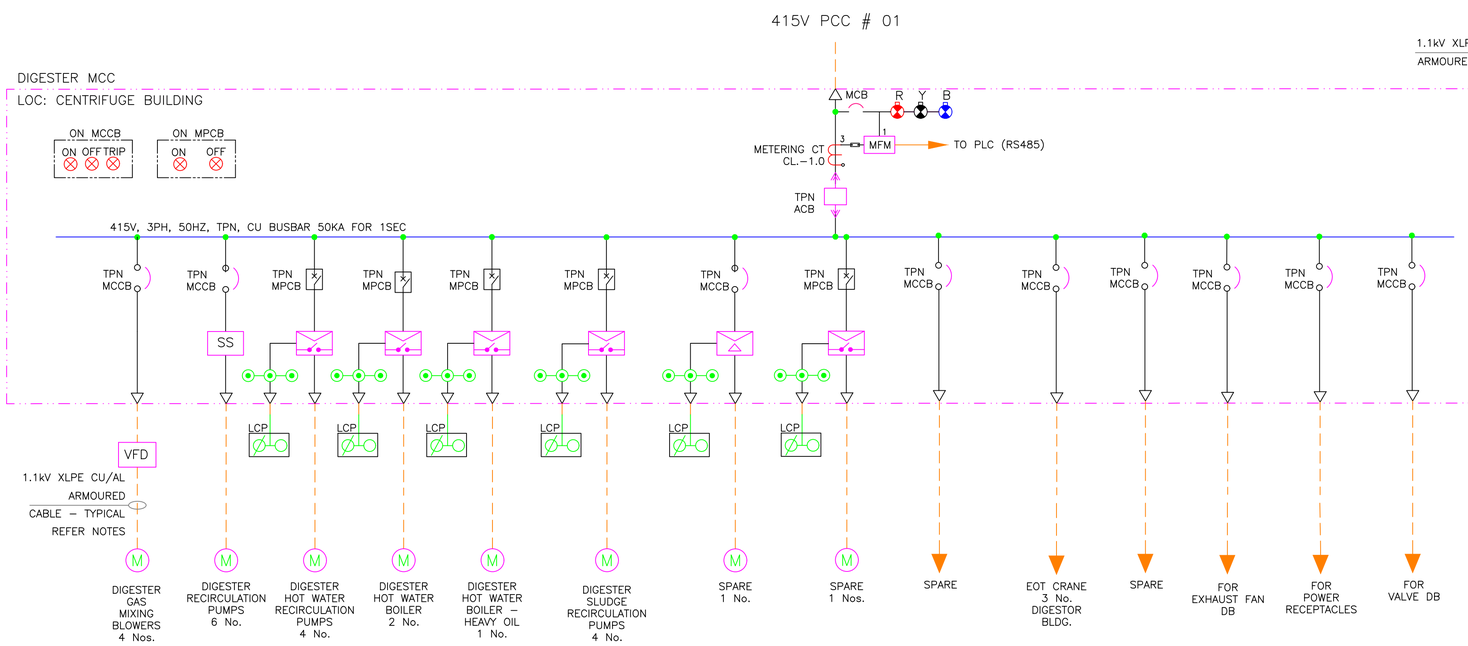

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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 04 OF 06

TATA CONSULTING ENGINEERS LIMITED
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SCALE : NTS	DWG NO. TCE.13052A-EL-4000-AU-40003	ISSUE P0
DC & DISC : BLR-EL		SIZE-A1

FILE NAME : SLD (75 MLD Madiwala).dwg

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FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 75MLD STP, MADIWALA LAKE

DWG NO TCE.13052A-EL-4000-AU-40003

NOTES:-

1. FOR GENERAL NOTES, LEGENDS, REFER DRAWING NO. TCE.13052A-EL-4001-AU-40001.

HEADWORKS & PRIMARY TREATMENT MCC

LOC: SUBSTATION BUILDING

415V PCC # 01

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — MFM — 1 — TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MCCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MCCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	DP MCCB	DP MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MPCB	TPN MCCB	TPN MCCB		
	LCP	LCP	LCP	LCP		LCP	LCP	LCP	VFD	LCP								LCP			1.1kV XLPE CU/AL ARMOURED CABLE – TYPICAL REFER NOTES	
FINE SCREEN PANEL	GRIT MECHANISM DRIVE 4 Nos.	GRIT TRANSFER PUMP 4 Nos.	GRIT WASHER MECHANISM 4 Nos.	GRIT DISCHARGE CONVEYOR 4 Nos.	EOT CRANE PRIMARY TREATMENT	MOT. VALVES 4 Nos.	MOT. VALVES 4 Nos.	PRIMARY CLARIFIERS 4 NOS.	PRIMARY SLUDGE PUMPS 6 NOS.	FOR EXHAUST FAN DB IN PLANT DG ROOM	FOR EXHAUST FAN DB IN ADMIN, LAB BUILDING	FOR AIR CONDITIONING IN SCADA, CONTROL ROOM BUILDING-2 Nos.	FOR AIR CONDITIONING IN CONFERENCE HALL, ENGINEERS ROOM-2 NOs.	SPARE	FOR POWER RECEPTACLES	FOR VALVE DB	SPARE 2 Nos.	SPARE 2 Nos.	ODOUR CONTROL UNIT-2 (NEAR HEAD WORKS)			

FINE SCREEN CONTROL PANEL

1.1kV XLPE CU/AL ARMOURED CABLE

MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	MOV L/R DCS	
SCREENING CONVEYOR WITH SCREENING COMPACTOR 1 No.	MOT. VALVE	MOT. VALVE	MOT. VALVE	MOT. VALVE	MOT. VALVE	FINE SCREENS 4 Nos. – 3 KW

CENTRIFUGE MCC

LOC: CENTRIFUGE BUILDING

415V PCC # 01

ON MCCB: ON OFF TRIP

ON MPCB: ON OFF

MCB R Y B

METERING CT CL.-1.0 — 3 — MFM — 1 — TO PLC (RS485)

TPN MCCB

415V, 3PH, 50HZ, TPN, CU BUSBAR 50KA FOR 1SEC

TPN MCCB	TPN MPCB	TPN MCCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MPCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MCCB	TPN MPCB	TPN MCCB	TPN MCCB					
VFD							VFD	VFD														
LCP	LCP	LCP	LCP	LCP	LCP	LCP	LCP	LCP	LCP						LCP							
DIGESTER FEED PUMPS 4 Nos.	GRAVITY SLUDGE THICKENER 2 No.	DILUTION WATER PUMPS 3 Nos.	CENTRIFUGE FEED SUMP MIXER 2 No.	POLYMER SYSTEM 3 Nos.	DEWATERED SLUDGE CONVEYOR 1 No.	MIXER INN SLUDGE BALANCING 1 No.	POLYMER DOSING PUMPS 3 Nos.	CENTRIFUGE FEED PUMPS 3 Nos.	CENTRIFUGE CONTROL PANEL MAIN DRIVE – 3Nos. BACK DRIVE – 3 NOs.	EOT CRANE 1 No. SLUDGE THICKENED BLDG.	EOT CRANE 1 No. CENTRIFUGE FEED PH	FOR EXHAUST FAN DB – 4 NOS.	FOR POWER RECEPTACLES	FOR VALVE DB	SPARE 2 Nos.	SPARE 2 Nos.	SPARE 1 No.	1.1kV XLPE CU/AL ARMOURED CABLE – TYPICAL REFER NOTES			

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CLIENT: BANGALORE WATER SUPPLY AND SEWERAGE BOARD

PROJECT NAME: 75 MLD CAPACITY STP AT MADIWALA

DWG NAME: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS SHEET 05 OF 06

TATA CONSULTING ENGINEERS LIMITED
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SCALE	DWG NO.	ISSUE
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FILE NAME: F-091-Rev-R1.dwg

TCE FORM NO. 091 R1

TITLE: SINGLE LINE DIAGRAM FOR THE ELECTRICAL WORKS AT 75MLD STP, MADIWALA LAKE

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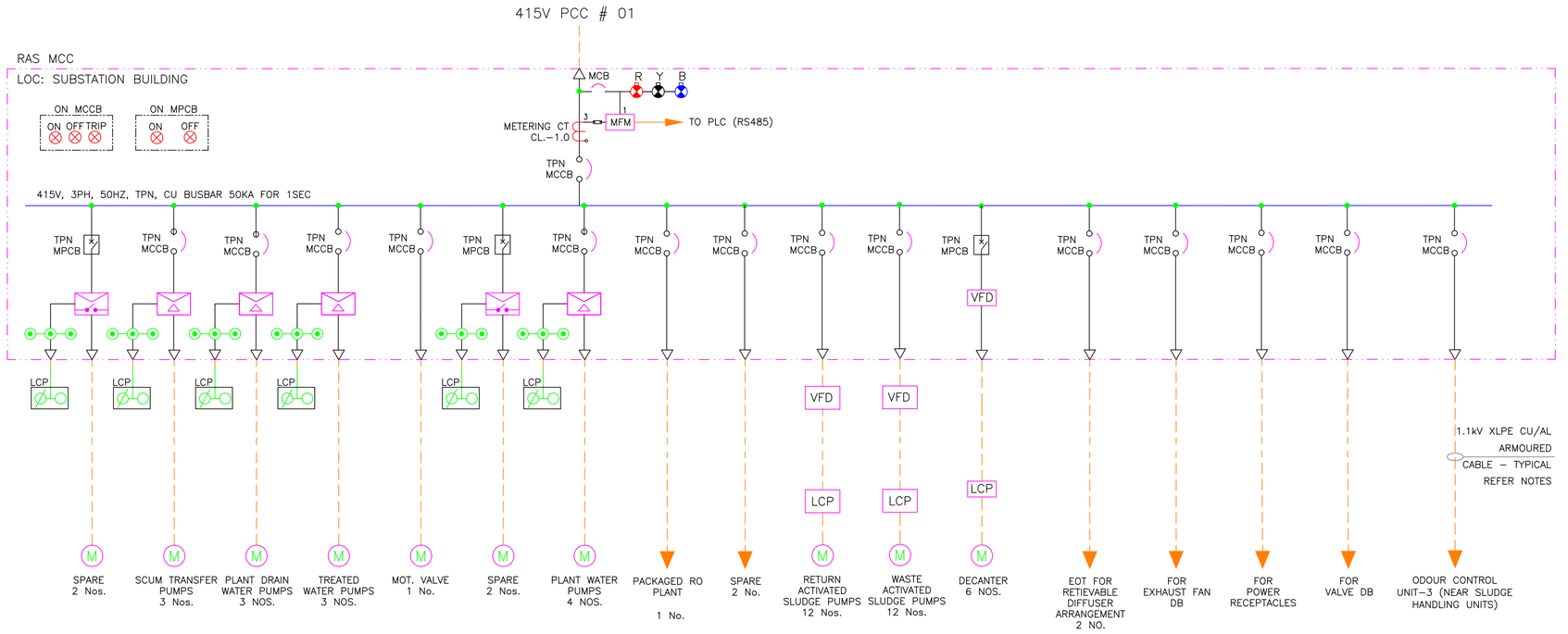

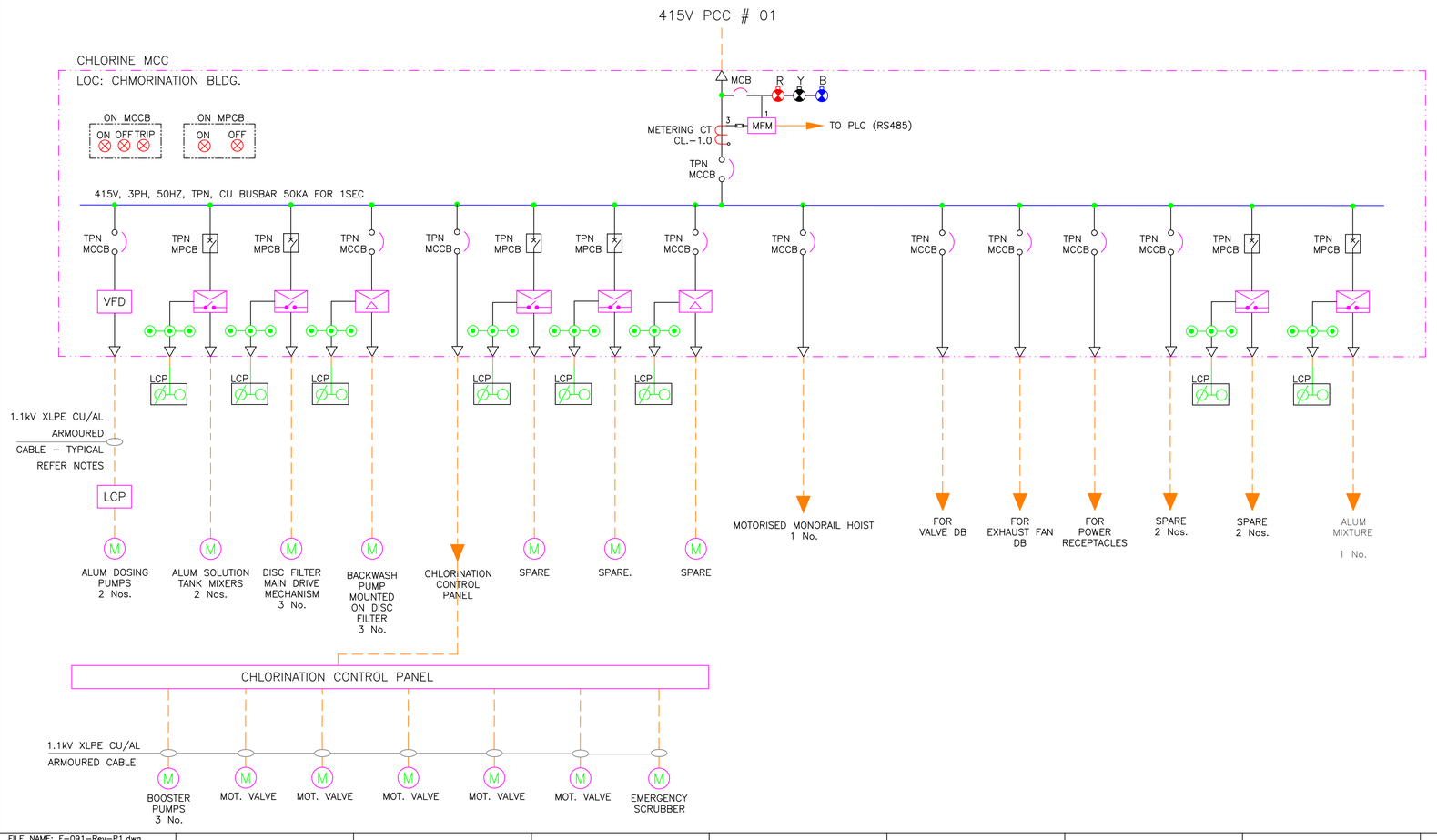

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